

**CLAIMS**

1. A management system for provisioning services to subscribers of a communication network, the management system comprising a Management Entity that has a Provisioning Node side intended for provisioning a service, and a number of Managed Entities each one having a Provisioned Node side intended for receiving provisioning orders from the Management Entity, the management system characterized in that:
  - the Provisioning Node side and the number of Provisioned Node sides support a Subscription Management Generic Interface (SuM-GI) that includes a SuM-GI Data Model and a number of SuM-GI Operations for managing the Objects Classes in said SuM-GI Data Model;
  - the Provisioning Node side comprises a SuM-GI Manager for managing subscriptions to services in any Managed Entity by operating on Objects Classes included in the SuM-GI Data Model, and a number of Protocol Adapters for communicating with specific protocol technologies used at each Managed Entity; and
  - the Provisioned Node side comprises a SuM-GI Agent for receiving provisioning orders operating on Object Classes included in the SuM-GI Data Model, and at least one Protocol Adapter for communicating with a particular protocol technology used by the SuM-GI Manager to send provisioning orders.
2. The management system of claim 1, wherein the Subscription Management Generic Interface (SuM-GI) is

arranged for holding specific attributes or characteristics of those objects included in the SuM-GI Data Model in a generic information placeholder associated to each particular object.

- 5    3. The management system of claim 2, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for allowing each individual SuM-GI Agent to determine whether or not each particular attribute in a list of attributes is applicable in the node where the SuM-GI Agent resides, the applicability depending on a specific internal data model in said node.
- 10    4. The management system of claim 3, wherein at least one Managed Entity is a Network Element in which a given service is provisioned, the Network Element thus having its own internal data model and further comprising a Mapping Module for mapping objects in the SuM-GI Data Model received from a Provisioning Node side to said own internal data model.
- 15    5. The management system of claim 4, wherein a number of Managed Entities may optionally form a hierarchical Sub-Network Manager structure interposed between a centralized Management Entity acting as a Network Manager, and a number of Network Elements, each Sub-Network Manager further comprising a Provisioning Node side toward a Managed Entity, this Managed Entity being a Network Element or another Sub-Network Manager.
- 20    6. The management system of claim 5, wherein each Sub-Network Manager comprises a SuM-GI Manager, a SuM-GI Agent and a number of Protocol Adapters, thus presenting a Provisioned Node side towards a Provisioning Node side at a Network Manager or at another Sub-Network Manager, and a Provisioning Node
- 25
- 30

Side towards a Provisioned Node side at a Network Element or at another Sub-Network Manager.

7. The management system of claim 1, wherein the Subscription Management Generic Interface (SuM-GI)
- 5 includes a SuM-GI Data Model characterized in that it comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:
- 10 - Subscription object class, intended for modeling the agreement or contract established between a subscriber and a service provider and arranged for containing all the information related with the subscription;
  - 15 - Subscriber object class, intended for identifying a subscriber holding a subscription with a service provider for a given service and arranged for registering a number of users allowed to use said given service;
  - 20 - ProvidedService object class, intended for modeling a service provider inventory of offered services and arranged for maintaining applicable capabilities of said offered services;
  - 25 - User object class, intended for identifying a user associated to a given subscriber and arranged for customizing particular user preferences for a given service; and
  - UserServicePreferences object class, intended for allowing a number of users associated with a subscriber to have particular service preferences

and arranged for containing different service capabilities enabled for each user.

5 8. The management system of claim 1, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Operation set intended to act on a SuM-GI Data Model and characterized by comprising any Operations, or combinations thereof, selected from groups of operations that include:

10 - creating, modifying, removing and getting Subscriber;

- creating, modifying, removing and getting User;

- creating, modifying, removing and getting Provided Service.

15 - creating, modifying, removing and getting Subscription;

- adding, removing and getting User to or from a given Subscription; and

- setting and getting User Service Preferences for a user under a given Subscription;

20 9. The management system of claim 7, wherein the Subscription Management Generic Interface (SuM-GI) further comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:

25 - SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a

list of the SuM-GI versions supported by known SuM-GI Agents;

- 5       - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and
  - 10      - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.
10. The management system of claim 1, wherein both Subscription Management Generic Interface (SuM-GI) Manager at a Provisioning Node side and SuM-GI Agent at
- 15      a Provisioned Node side comprise means for mutual assignation of a specific protocol technology for communicating with each other.
11. A method for provisioning services to subscribers of a communication network, the method applying between a
- 20      Management Entity that has a Provisioning Node side intended for provisioning a service, and a number of Managed Entities each one having a Provisioned Node side intended for receiving provisioning orders from the Management Entity, the method **characterized by**
- 25      comprising the steps of:
- 30      - assigning a specific protocol technology for communication between a Subscription Management Generic Interface (SuM-GI) Manager at a Provisioning Node side and each SuM-GI Agent at respective Provisioned Node sides;

- sending provisioning orders from a SuM-GI Manager toward at least one SuM-GI Agent with a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model; and
  - 5       - determining at a SuM-GI Agent, upon receipt of a provisioning order from a SuM-GI Manager, whether current node is a Network Element (NE) where the service is provisioned or there is at least one lower hierarchical Managed Entity, namely a Sub-  
10       Network Manager or a Network Element, where the provisioning order must be submitted.
12. The method of claim 11, wherein upon receipt of a provisioning order from a Subscription Management Generic Interface (SuM-GI) Manager in a SuM-GI Agent at  
15       a Sub-Network Manager, the method further comprises the steps of:
- transferring the provisioning order received from a first SuM-GI Manager at a Provisioning Node side of a Management Entity or higher hierarchical Managed  
20       Entity toward a second SuM-GI Manager at a Provisioning Node side of the current node;
  - assigning a specific protocol technology for communication between the second SuM-GI Manager at the Provisioning Node side of the current node and  
25       each SuM-GI Agent at respective Provisioned Node sides of lower hierarchical Managed Entities; and
  - sending provisioning orders from the second SuM-GI Manager toward at least one SuM-GI Agent at a Provisioned Node side of a lower hierarchical  
30       Managed Entity with a number of SuM-GI Operations

intended for operating on Object Classes included in a SuM-GI Data Model.

13. The method of claim 11, wherein upon receipt of a provisioning order from a Subscription Management Generic Interface (SuM-GI) Manager in a SuM-GI Agent at a Network Element, the method further comprising the steps of:
- 5                   - mapping the provisioning order received from a SuM-GI Manager at a Provisioning Node side with a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model into a number of internal operations intended for operating on an internal data model supported by the current Network Element; and
  - 10                   - acting on the internal data model with the mapped internal operation in order to carry out the provisioning order received from a SuM-GI Manager at a Provisioning Node side.
14. The method of claim 13, wherein upon receipt of a provisioning order from a Subscription Management Generic Interface (SuM-GI) Manager in a SuM-GI Agent at a Network Element for which resulting data is expected, the method further comprising the steps of:
- 20                   - mapping the resulting data of an internal data model into appropriate parameters of a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model; and
  - 25                   - returning provisioning order results from the SuM-GI agent toward the SuM-GI Manager at a Provisioning Node side of a Management Entity or higher
  - 30

hierarchical Managed Entity with appropriate parameters in a number of SuM-GI Operations intended for operating on Object Classes included in a SuM-GI Data Model..

- 5 15. The method of claim 11, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Data Model characterized in that it comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:
- 10 - Subscription object class, intended for modeling the agreement or contract established between a subscriber and a service provider and arranged for containing all the information related with the subscription;
- 15 - Subscriber object class, intended for identifying a subscriber holding a subscription with a service provider for a given service and arranged for registering a number of users allowed to use said given service;
- 20 - ProvidedService object class, intended for modeling a service provider inventory of offered services and arranged for maintaining applicable capabilities of said offered services;
- 25 - User object class, intended for identifying a user associated to a given subscriber and arranged for customizing particular user preferences for a given service; and
- 30 - UserServicePreferences object class, intended for allowing a number of users associated with a subscriber to have particular service preferences



and arranged for containing different service capabilities enabled for each user.

16. The method of claim 11, wherein the Subscription Management Generic Interface (SuM-GI) includes a SuM-GI Operation set intended to act on a SuM-GI Data Model and characterized by comprising any Operations, or combinations thereof, selected from groups of operations that include:
- creating, modifying, removing and getting Subscriber;
  - creating, modifying, removing and getting User;
  - creating, modifying, removing and getting Provided Service.
  - creating, modifying, removing and getting Subscription;
  - adding, removing and getting User to or from a given Subscription; and
  - setting and getting User Service Preferences for a user under a given Subscription;
17. The method of claim 15, wherein the Subscription Management Generic Interface (SuM-GI) further comprises any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:
- SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a

list of the SuM-GI versions supported by known SuM-GI Agents;

5       - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and

10       - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.

15       18. The method of claim 11, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for holding specific attributes or characteristics of those objects included in the SuM-GI Object Model in a generic information placeholder associated to each particular object.

20       19. The method of claim 18, wherein the Subscription Management Generic Interface (SuM-GI) is arranged for allowing each individual SuM-GI Agent to determine whether or not each particular attribute in a list of attributes is applicable in the node where the SuM-GI Agent resides, the applicability depending on a specific internal data model in said node.

25       20. A use of a Subscription Management Generic Interface (SuM-GI) comprising a SuM-GI Data Model and SuM-GI Operations intended for provisioning services to subscribers of a communication network wherein said Subscription Management Generic Interface (SuM-GI)  
30       operates in accordance with an Integration Reference Point (IRP) specification within an IRP Generic Network

Resource Model by further comprising any Managed Object Class, or combinations thereof, selected from a group of Object Classes that includes:

- 5       - SubscriptionIRP object class, intended for indicating to a SuM-GI Manager the SuM-GI version supported by each particular SuM-GI Agent in a Managed Entity, and thus arranged for comprising a list of the SuM-GI versions supported by known SuM-GI Agents;
- 10      - SubscriptionFunction object class, intended for sub-classing Subscription, Subscriber, User, and UserServicePreferences related object classes and arranged for providing attributes that are common to underlying Managed Object Classes; and
- 15      - ServiceProviderFunction object class, intended for sub-classing ProvidedService related object classes and arranged for providing attributes that are common to underlying Managed Object Classes.